

CHRISTINE ADAIR MAGGS

School of Biology & Biochemistry
Queen's University, Belfast BT9 7BL, N. Ireland

Date of birth: 8 June 1956

Age: 48

Nationality: British

Marital status: Married, one child

EDUCATION

1967-1974	South Hampstead High School, London, England 'A' levels: Biology A, Chemistry E, Geography A
1975-1978	St Catherine's College, Oxford University, England BA (Hons) Second Class in Botany
1980-1983 Galway	PhD, Department of Botany, National University of Ireland

EMPLOYMENT

June-August 1978	Vacation student at Botany Department, The Natural History Museum, London
October 1978 - May 1979	Research assistant, Consumers' Association, 14 Buckingham St, London WC2
May-October 1979	Research assistant, Field Studies Council Oil Pollution Research Unit, Orierton Field Centre, Pembroke, Wales
October 1983 - September 1984	Research fellow, Botany Department, Queen's University, Belfast, N. Ireland
October 1984 - June 1986	Part-time teaching, Queen's University, Belfast
March-May 1986	Temporary lecturer, University of Ulster, Jordanstown
July 1986 - July 1988	Postdoctoral fellow, Atlantic Research Laboratory 1411 Oxford St, Halifax, Nova Scotia, Canada
September 1988 - August 1992	Research fellow (funded by NCC), School of Biology & Biochemistry, Queen's University, Belfast
September 1992 - December 1994	NERC Advanced Research Fellow, based at School of Biology & Biochemistry, Queen's University, Belfast
January 1995 to date	Lecturer in Marine Biology, School of Biology & Biochemistry, Queen's University, Belfast.
2000	Promoted to Reader.
2004	Promoted to Professor.

TEACHING EXPERIENCE

University College, Galway, 1980-1983: Demonstrator, Introductory Botany practical classes. Assisted with 2nd and 3rd year Phycology practical classes and marine field trips 1980-1983.

Queen's University, Belfast, 1984-1986: Demonstrator, 1st and 2nd year Botany practical classes. 1985-1986: Lectured on Plant Physiology course.

University of Ulster, Jordanstown, 1985: Lectured Plant Physiology courses

Queen's University, Belfast, 1988-1994: Supervised two BSc Honours projects and one PhD student in molecular systematics of marine red algae. Taught Biogeography and Coastal Ecology for part-time B. General Studies course (1992 and 1993). Marine Plants Honours course, 1994.

Queen's University, Belfast, 1995 to date: Full-time lecturer teaching at all levels in School of Biology and Biochemistry.

MEMBERSHIPS OF LEARNED SOCIETIES

British Phycological Society: Committee for Conservation and Biodiversity.

European Phycological Society: member, organizing committee for European Phycological Congresses (Cologne, 1996; Montecatini, 1999; Belfast, 2003; Oviedo 2007). Member, local organizing committee of EPC3 Belfast, with responsibilities including aspects of financial management, scientific programme and entertainment.

International Phycological Society: member, International Organizing Committee for International Phycological Congresses (Leiden, 1998; Thessaloniki, 2001; Durban, 2005); Vice-President/President Elect, 2004

Phycological Society of America: member, "Award of Excellence" Committee 2000-2004

Fellow of the Linnean Society

International Association of Plant Taxonomists

American Botanical Society

Systematics Association

SCIENTIFIC/ACADEMIC RECOGNITION

2005: Symposium organizer and speaker at International Phycological Congress, Durban
External examiner (first opponent) for PhD thesis examination in Umea, Sweden.

2003: Symposium organizer at Third European Phycological Congress, Belfast.

2002: External examiner (first opponent) for PhD thesis examination in Oslo, Norway.
External examiner for MSc thesis, Cape Town, South Africa
Supervisor of Open University PhD student in Naples, Italy
Invited speaker at first NSF-funded CORONA biogeography workshop, New Hampshire

2001: Symposium organizer for International Phycological Congress
External examiner for PhD thesis examination in Melbourne, Australia
External examiner for Habilitation examination in Lille, France

1999: Invited symposium speaker at International Botanical Congress in Missouri
Invited symposium speaker at 2nd European Phycological Congress
External examiner for PhD thesis examination in Guelph, Canada.

- 1995: Won Prescott award of the Phycological Society of America for best book in Phycology during the preceding two years, for my book co-authored with Max Hommersand.
- 1994: Won Provasoli award of the Phycological Society of America for my paper on molecular systematics of *Gymnogongrus*, judged one of the two best papers published in the leading journal, the *Journal of Phycology*, for the period 1992-3.
- First Opponent (leading the team of three external examiners) for PhD examination, Oslo, Norway.
- External examiner for PhD thesis examination, Cardiff.

PUBLICATIONS AND SCIENTIFIC MEETINGS

A list of publications is attached.

I was the Editor-in-Chief of the *European Journal of Phycology* for 10 years to 2004 and am currently an Associate Editor of *Journal of Phycology*; I am on the Editorial Board of *Annales Botanici Fennici*, *Systematics and Biodiversity* and *Biology and Environment* and was an Associate Editor of *Phycologia* (1991-1993); I also act as a reviewer for journals including *Molecular Ecology*, *Acta Botanica*, *Annals of Botany*, *Blumea*, *Botanical Reviews*, *Botanica Marina*, *Bulletin of Marine Science*, *Canadian Journal of Botany*, *Cryptogamie Algologie*, *Journal of Applied Phycology*, *Nordic Journal of Botany*, *Science* and *PNAS*.

From 1982 onwards I have regularly presented papers at national and international botanical and phycological meetings in Ireland, Britain, France, Germany, United States, Canada, Japan and Australia. I was invited to participate in symposia at many of these meetings. I have received financial support for attendance from the International Phycological Society, the Royal Society, NATO and Canadian NSERC.

GRANTS AND CONTRACTS

- 2004: £135,000 (with various collaborators) from Esmée Fairbairn Foundation for SPLASH (Special Protection and Local Action for Species and Habitats).
- 2004: £72,000 (with Dr J. Provan) from EU/EHS Building Sustainable Prosperity for study of red alga *Ahnfeltiopsis* sp.
- 2004: £63,000 contract (NS SHARE) developing monitoring tools for Water Framework Directive
- 2004: £12,000 contract to EHS on effects of seaweed harvesting in N Ireland
- 2004: £20,000 from Esmée Fairbairn Foundation for UK-ALIENS (led by SAMS)
- 2003: £200,000 for EU FP6 STREP "HIPPOCRATES" (Leader in QUB M. Dring)
- 2003: £161,044 share of £1.3 million grant from EHS for QUERCUS Centre for Conservation and Biodiversity (led by W.I. Montgomery)
- 2003: £4000 from Akvamiljo Caspian for Caspian seagrass study
- 2003: £1000 from Countryside Council for Wales for red algal identification course
- 2002: £105,000 (with J. Provan and G. Savidge) from NERC for genetics of copepods
- 2002: £2750 from NERC Radiocarbon budget for establishing local Marine Reservoir Effect.
- 2002: £11,000 (with F. Bunker) from Countryside Council for Wales for Species Challenge Fund *Zostera* study.
- 2001: £159,576 (with 2 QUB co-applicants) from EU Framework 5 for study of algal introductions
- 2001: £6000 contract from Countryside Council for Wales for analysis of algal and turbidity data

2000: £140,000 (with 2 QUB co-applicants) from EU Framework V for algal aquaculture
 2000: £8000 contract from Environment and Heritage Service for survey of *Sargassum muticum*
 1999: £26000 grant from NERC for radiocarbon dating of coralline algae
 1999: £600 from British Phycological Society for summer studentships
 1998: £750 from Systematics Association for red algal phylogeography
 1997: Obtained (with 3 QUB co-applicants) £165,700 from EU FAIR programme for aquaculture of *Palmaria* (dulse).
 1997: Awarded two contracts from Scottish Association for Marine Science and Countryside Council for Wales (total £10,500).
 1994: £10,000 grant from NIDeVR fund for molecular taxonomy of algae.
 1994: Awarded £2000 contract from JNCC for a publication on introduced algae.
 1992: £17000 grant from NERC for study of diatom species.
 1991: £62000 grant from NERC for "Taxonomy of genus *Ceramium*..."
 1988: I successfully obtained funding for my own salary for the six years to 1994 (from the NCC, now JNCC, and NERC) and for costs (from British Petroleum and the British Phycological Society) while working on my book

RESEARCH INTERESTS

Research experience

The initial subject of my PhD research in Ireland (from 1980 to 1983) was a quantitative phenological study of the algae of a sublittoral community on maerl (unattached coralline algae). The immediate problems of identifying the component species could be resolved only by comparative taxonomic studies, including the proposal of new species. Once the taxonomic problems were overcome, these communities proved suitable for detailed study of seasonal phenomena. Life histories and development were studied in the field and by isolating algae into culture; responses to environmental conditions were investigated in the laboratory. These studies of marine algal morphogenesis under natural and controlled conditions were continued at Queen's University (1983-1986), involving a monthly programme of sublittoral sampling in Strangford Lough. The resulting publications have made significant contributions to our knowledge of marine algal ecology and the environmental regulation of seaweed morphogenesis.

As a postdoctoral researcher at the Atlantic Research Laboratory (now Institute for Marine Biosciences), Canada (1986-1988), I carried out further biosystematic studies on two commercially harvested genera of the red algae. Despite the commercial importance of the agarophyte *Agarfelisia*, its systematic position was unknown. A wide range of techniques was utilized, including regular field sampling to obtain details of natural phenology and morphogenesis; light and electron microscopy; and fluorochrome and haematoxylin staining for karyological data. The problem was satisfactorily resolved by the proposal of a new family and order of the Rhodophyta; gene sequences subsequently obtained by my collaborators in Canada confirmed the unique phylogenetic position of this ancient genus. In the large carageenophyte genus *Gymnogongrus*, phenotypic plasticity creates serious taxonomic problems. At ARL, recently developed techniques for obtaining plastid DNA from red algae were employed on a study of *Gymnogongrus* taxonomy. Restriction fragment length analysis, followed by probing of Southern blots, discriminated unequivocally between morphologically similar species and showed that an unidentified crustose red alga represented an uncoupled life history phase of one of the species. When I returned to Belfast, my collaborative study with the Atlantic Research Laboratory on the molecular systematics of *Gymnogongrus* continued and was extended to include all the NE Atlantic representatives of this genus, using plastid DNA restriction analysis and RUBISCO intergenic spacer sequences (Maggs *et al.*, 1992).

From 1988 to 1993 my research centred around the production of the Ceramiales volume of the flora *Seaweeds of the British Isles*, published by the Natural History Museum and HMSO in 1993. This involved extensive field collections throughout Britain and Ireland, working through collections of preserved material, examination of selected species in culture, and herbarium-based research. My contacts with the Joint Nature Conservation Committee (JNCC) enabled me to participate in sublittoral surveys in Scotland and the Isles of Scilly, which were very valuable for obtaining specimens and determining the number of species to be included in the flora. This research was funded by the JNCC, as part of their marine conservation programme, and additional funds were obtained from British Petroleum and the British Phycological Society.

Current research

The marine research group, in collaboration with Dr Jim Provan, is currently engaged in a wide range of projects concerning aspects of the taxonomy, phylogeny and population genetics of macroalgae, combining molecular and traditional approaches, such as laboratory culture studies, including studies of interfertility between strains and species; karyological studies; and traditional morphological taxonomic studies employing the type method. Molecular techniques in use include: Sequencing of various chloroplast and mitochondrial genes and intergenic spacers; AFLP analyses of total genomic DNA; Microsatellites. Various aspects of marine algal ecology are being pursued in collaboration with Dr Mark Johnson. Some ongoing projects are described briefly below.

- (1) Phylogenetics and biogeography of the largest red algal order Ceramiales are being investigated by a wide range of approaches: the chloroplast-encoded gene *rbcL* is being sequenced for multiple taxa to clarify the taxonomy of the target groups.
- (2) Molecular ecology of the important fouling green algal genus *Ulva*: Inter- and intrapopulation variation is being investigated using molecular markers. The genus is being taxonomically revised using molecular and morphological characters; many of the results have now been published (see publications list).
- (3) Genetics of the edible red seaweed *Palmaria palmata* (dulse): High levels of genetic variation have been found using RAPD and RFLP markers in local populations; phylogeographic structure indicates various North Atlantic glacial refugia.
- (4) Algal images web-based project with Frances Bunker (MarineSeen, Pembroke) to illustrate *Seaweeds of the British Isles*.
- (5) The unattached coralline algae known as maerl, which form extensive beds in Scotland and Ireland, are being surveyed in Northern Ireland for their conservation and ecological interest. In addition, their potential as a palaeoenvironmental archive is being explored, in collaboration with the Department of Geography, QUB.
- (6) Ecology of the fucoid seaweed *Ascophyllum nodosum*: grazing interactions with the large limpet *Patella vulgata* are being investigated, particularly in relation to climate change.
- (6) Marine macroalgal elements of the Water Framework Directive: contract research (funded as a cross-border collaboration) is developing monitoring tools for compliance with the WFD.

PUBLICATIONS LIST

BOOK

Maggs, C.A. & Hommersand, M.H. (1993) *Seaweeds of the British Isles. Volume 1 Rhodophyta, Part 3A Ceramiales*. Natural History Museum/HMSO, London. 444 pp.

REFEREED PUBLICATIONS

- Johnson, M.P., Maggs, C.A., Bunker, F. & Edwards, M. (2005). Algal epiphytes of *Zostera marina*: variation in assemblage structure from individual leaves to regional scales. *Aquatic Botany*, in press.
- Provan, J., Wattier, R.A. & Maggs, C.A. (2005) Phylogeographic analysis of the red seaweed *Palmaria palmata* reveals a Pleistocene marine glacial refugium in the English Channel. *Molecular Ecology*, 14: 793-803.
- Provan, J., Murphy, S. & Maggs, C.A. (2005). Tracking the invasive history of the green alga *Codium fragile* subsp. *tomentosoides*. *Molecular Ecology*, 14: 189-184.
- Ni Chualáin, F., Maggs, C.A., Saunders, G. W. & Guiry, M.D. (2004). The invasive genus *Asparagopsis* (Bonnemaisoniaceae, Rhodophyta): molecular systematics, morphology and ecophysiology of *Falkenbergia* isolates. *Journal of Phycology*, 40:1112-1126.
- Provan, J., Murphy, S. & Maggs, C.A. (2004) Universal plastid primers for Chlorophyta and Rhodophyta. *European Journal of Phycology*, 39: 43-50.
- Wilson, S., Blake, C., Berges, J.A. & Maggs, C.A. (2004) Environmental tolerances of free-living coralline algae (maerl): implications for European marine conservation. *Biological Conservation*, 120: 283-293.
- Blake, C. & Maggs, C.A. (2003). Comparative growth rates and internal banding periodicity of maerl species (Corallinales, Rhodophyta) from northern Europe. *Phycologia*, 42: 606-612.
- Hayden, H.S., Blomster, J., Maggs, C.A., Silva, P.C., Stanhope, M.J. and Waaland, J. R. (2003). Linnaeus was right all along: *Ulva* and *Enteromorpha* are not distinct genera. *European Journal of Phycology*, 38: 277-294.
- Wilce, R.T., Maggs, C.A. & Sears, J.R. (2003). *Waernia mirabilis* gen. nov., sp. nov. (Dumontiaceae, Gigartinales): a new non-coralline crustose red alga and its relationship to *Gainia* and *Blinksia*. *Journal of Phycology*, 39: 1-16.
- McIvor, L., Maggs, C.A. Guiry, M.D. & Hommersand, M.H. (2002). Phylogenetic analysis of the geographically disjunct genus *Osmundea* Stackhouse (Rhodomelaceae, Rhodophyta). Constancea, available at <http://ucjeps.berkeley.edu/constancea/>
- Blomster, J., Back, S., Fewer, D.P., Kiirikki, M., Lehvo, A., Maggs, C.A. & Stanhope, M.J. (2002). Green tide conditions trigger novel morphology in *Enteromorpha*. *American Journal of Botany*, 89:1756-1763.
- Maggs, C.A. & McIvor, L. (2002). *rbcL* analysis supports the tribe Gymnothamnieae Kajimura (Ceramiaceae, Rhodophyta). *Cryptogamie algologie*, 23: 263-274.
- Maggs, C.A., Ward, B.A., McIvor, L.M, Evans, C.M., Rueness, J. & Stanhope, M.J. (2002). Molecular taxonomy of fully corticated, non-spiny species of *Ceramium* (Ceramiaceae, Rhodophyta) in the British Isles. *Phycologia*, 41: 409-420.
- McIvor, L., Maggs, C.A. & Stanhope, M.J. (2002). *rbcL* sequences indicate a single evolutionary origin of multinucleate cells in the red algal tribe Callithamnieae. *Molecular Phylogenetics and Evolution* 23: 433-446.
- Wattier, R.A. & Maggs, C.A. (2001). Intraspecific variation in seaweeds: the application of new tools and approaches. *Advances in Botanical Research*, 35: 171-212.
- McIvor, L., Maggs, C.A., Provan, J. & Stanhope, M.J. (2001). *rbcL* sequences reveal multiple cryptic introductions of the Japanese red alga *Polysiphonia harveyi*. *Molecular Ecology*, 10: 911-919.
- Wattier, R.A., Davidson, A.L., Ward, B.A. & Maggs, C.A. (2001). cpDNA-RFLP in *Ceramium* (Rhodophyta): intraspecific polymorphism and species-level phylogeny. *American Journal of Botany*, 88: 1209-1213.
- Nam, K.W., Maggs, C.A., McIvor, L. & Stanhope, M.J. (2000). Taxonomy and phylogeny of *Osmundea* (Rhodomelaceae, Rhodophyta) in Atlantic Europe. *Journal of Phycology*, 36: 759-772.

- Kim, M.-S., Maggs, C.A., McIvor, L. & Guiry, M.D. (2000). Reappraisal of the type species of *Polysiphonia* (Rhodomelaceae, Rhodophyta). *Eur. J. Phycol.* 35: 83-92.
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- Blomster, J., Maggs, C.A. & Stanhope, M.J. (1999) Extensive intraspecific morphological variation in *Enteromorpha muscoides* (Chlorophyta) revealed by molecular analysis. *Journal of Phycology*, 35: 575-586.
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- Maggs, C.A. & Stegenga, H. (1999). Red algal exotics on North Sea coasts. *Helgoland Meeresunters.* 52: 243-258.
- Maggs, C.A. (1998) Life history variation in *Dasya ocellata* (Dasyaceae, Rhodophyta). *Phycologia*, 37: 100-105.
- Blomster, J., Maggs, C.A. & Stanhope, M.J. (1998) Molecular and morphological analysis of *Enteromorpha intestinalis* and *E. compressa* (Chlorophyta) in the British Isles. *J. Phycol.*, 34: 319-340.
- Maggs, C.A. (1997) Life history of the rare red alga *Tsengia bairdii* (= *Platoma bairdii*) (Nemastomataceae, Rhodophyta) from Scotland. *Cryptogamie, Algologie*, 1997 (2): 151-161.
- Nelson, W.A. & Maggs, C.A. (1996) Records of adventive marine algae in New Zealand: *Antithamnionella ternifolia*, *Polysiphonia senticulosa* (Ceramiales, Rhodophyta) and *Striaria attenuata* (Dictyosiphonales, Phaeophyta). *New Zealand J. Mar. Freshw. Res.* 30: 449-453.
- Maggs, C.A. & Ward, B.A. (1996) The genus *Pikea* (Dumontiaceae, Rhodophyta) in England and the North Pacific: comparative morphological, life-history and molecular studies. *J. Phycol.*, in press.
- Silva, P.C., Maggs, C.A. & Irvine, L.M. (1995) Proposal to change the listed type of *Ptilota* C. Agardh, nom. cons. (Rhodophyceae). *Taxon*, 44: 415-418.
- Nam, K.W., Maggs, C.A. & Garbary, D.J. (1994) Resurrection of the genus *Osmundea* with an emendation of the generic delineation of *Laurencia* (Ceramiales, Rhodophyta). *Phycologia* 33: 384-395.
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- Maggs, C.A. & Rico, J.M. (1991) Karyological evidence of meiosis in *Gelidium latifolium* (Gelidiaceae, Rhodophyta) from Ireland. *Phycologia* 30: 487-494.

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INVITED ARTICLES FOR EDITED VOLUMES

- John, D.M. & Maggs, C.A. (1997) Species problems in eukaryotic algae: a modern perspective. In: Claridge, M.F., Dawah, H.A. & Wilson, M.R. (eds) *The Units of Biodiversity: Species in Practice*. Systematics Association Special Volume, pp. 83-107. Chapman & Hall, London.
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OTHER PUBLICATIONS

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